

**MELANOTRICHUS WHITEHEADI, A NEW CRUCIFER-FEEDING
PLANT BUG FROM THE SOUTHEASTERN UNITED STATES, WITH
NEW RECORDS FOR THE GENUS AND A KEY TO THE SPECIES OF
EASTERN NORTH AMERICA (HETEROPTERA: MIRIDAE: ORTHOTYLINAE)**

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Abstract. — The new orthotyline mirid *Melanotrichus whiteheadi* is described from specimens collected in Florida, Georgia, and South Carolina. This species is a crucifer specialist apparently restricted to feeding on tansy mustard, *Descurainia pinnata pinnata*, a native to southern United States. An adult habitus, figures of male genitalia, and micrographs of other structures of *M. whiteheadi* are provided, the first eastern record for *M. brindleyi* Knight and additional records of *M. leviculus* Knight are reported, published records of the immigrant *M. concolor* (Kirschbaum) and *M. virescens* (Douglas and Scott) are clarified, and a key is given to help recognize the eight eastern North American species of *Melanotrichus*.

Key Words: Insecta, Heteroptera, Miridae, eastern nearctic, *Melanotrichus*, key, new species

Before this study, only four of the 25 North American species of *Melanotrichus* Reuter were recorded from the eastern United States (Henry and Wheeler 1988). Knight (1923) included *M. catulus* (Van Duzee), *M. concolor* (Kirschbaum), and *M. flavosparsus* (Sahlberg) in his key to the species of *Orthotylus* Fieber of Connecticut. Knight (1927) later raised Reuter's subgenus *Melanotrichus*, with *M. flavosparsus* as the type species, to generic status based on two types of dorsal pubescence and the form of the left paramere, and described *M. leviculus* from coastal New York. In his "Miridae of Illinois," Knight (1941) provided a key to identify *M. althaeae* Hussey, *M. catulus*, and *M. flavosparsus*. Kelton (1979a, b), however, moved *M. althaeae* to his new genus *Brooksetta*, leaving only four eastern species in the genus.

Species of *Melanotrichus* can be recognized by the dusky-brown to green coloration,

convergent parempodia, dorsum with both simple and scalelike setae, a produced tylus that is broad and anteriorly flattened in lateral aspect, the C-shaped left paramere in dorsal aspect, and the pair of dorsally directed processes on the ventral margin of the aperture of the male genital segment. The genus can be keyed in Kelton (1980), Knight (1941), and Slater and Baranowski (1978). In the latter two keys, an extra couplet is needed to accommodate *Brooksetta*, which now contains the species bearing black, scalelike setae on the dorsum.

In this paper I describe the new species *M. whiteheadi* from southeastern United States, give the first eastern record for *M. brindleyi* Knight and additional records of *M. leviculus* Knight, and clarify confusion between *M. concolor* (Kirschbaum) and *M. virescens* (Douglas & Scott). Also provided are an adult habitus, figures of male genitalia, and micrographs of other pertinent

structures of *M. whiteheadi*, and an identification key to help distinguish the eight eastern North American species of *Melanotrichus*.

The following abbreviations are used for institutions cited in this paper: AMNH (American Museum of Natural History, New York); CNC (Canadian National Collection, Ottawa); DAR (David A. Rider collection); UCM (University of Colorado Museum, Boulder); FSCA (Florida State Collection of Arthropods, Gainesville); PDA (Bureau of Plant Industry, Pennsylvania Department of Agriculture, Harrisburg); TAM (Texas A&M University, College Station); and USNM (U.S. National Museum of Natural History, Washington, D.C.).

Melanotrichus brindleyi Knight

This species was described from Idaho, Minnesota, and Wyoming (Knight 1968) and later reported from Alberta, Manitoba, and Saskatchewan on *Antennaria campestris* Rydb. [Asteraceae] (Kelton 1980). It is best recognized by the long rostrum that extends well beyond the metacoxae.

New records are MAINE: Aroostook Co., American Realty Road, 2.5 mi. W. of Ashland, 5 July 1989, T. J. Henry and A. G. Wheeler, taken on *Anaphalis* sp. [Asteraceae] (USNM); Piscataquis Co., Millinocket Road, near Baxter State Park, 4 July 1989, T. J. Henry and A. G. Wheeler, Jr., taken on *Anaphalis* sp. (USNM).

Melanotrichus catulus (Van Duzee)

Van Duzee (1916) described this species from New York. It is now known to range from Maine to Minnesota, south to Missouri and West Virginia (Henry and Wheeler 1988). Low cudweed, *Gnaphalium uliginosum* L. [Asteraceae] (Knight 1941), and *Antennaria* sp. [Asteraceae] (Wheeler et al. 1983) have been cited as hosts. This species is readily recognized by the dusky-brown dorsum and short second antennal segment.

A new state record is NORTH CAROLINA: Gaston Co., near Crowders Moun-

tain, 22 April 1988, T. J. Henry and A. G. Wheeler, Jr., [adults and nymphs] taken on *Antennaria plantaginifolia* (L.) Richards (USNM). A new Canadian record is ONTARIO: Parry Sound, 10 July 1915, H. S. Parish (USNM).

Melanotrichus coagulatus (Uhler)

Described from Colorado (Uhler 1877), this species is now known from Alberta to Manitoba and south to Texas, California, and Mexico (Henry and Wheeler 1988). Early records of *M. coagulatus* from the East are misidentifications of *M. flavosparsus*. Kelton (1980) recorded lamb's quarters, *Chenopodium album* L. [Chenopodiaceae], as the host in the Prairie Provinces.

Although not reported east of the Mississippi River, I have included *M. coagulatus* in the key because of its great similarity to *M. flavosparsus* and its occurrence in Iowa and central Canada. Both species have a mottled-green appearance, bear clusters or patches of silvery scalelike setae on the hemelytra, and prefer species of *Chenopodium* as hosts.

Melanotrichus coagulatus is best distinguished by the dark tibial spines, dusky cloud on the hemelytral membrane, and the inward-curving arm of the left paramere as illustrated by Kelton (1980).

Melanotrichus concolor (Kirschbaum)

This palearctic species was first reported in North America from Woods Hole, Massachusetts (Knight 1922). I have studied Knight's specimens from Woods Hole (USNM) and have found that they represent *M. virescens* (Douglas and Scott); consequently, the first North America record of *M. concolor* is from British Columbia (Anon. 1932). I have been unable to confirm Moore's (1950) record from Quebec, but if he used Knight's (1922, 1923) description and key (1923) to determine his specimens, or if Knight identified this material, then these Canadian specimens also should be referred to *M. virescens*. *Melanotrichus con-*

color also has been reported from California (Waloff 1966) and Wisconsin (Akingbohngbe 1972), suggesting multiple introductions with its host Scotch broom, *Cytisus scoparius* (L.) Link. [Fabaceae].

In my key *M. concolor* runs to the couplet with *M. virescens*, but is readily separated by the pale-green dorsum, with sparsely intermixed, dark setae, and the pale femoral setae and tibial spines.

Melanotrichus flavosparsus (Sahlberg)

Reuter (1875) gave the first correct North American report of this species, but Kelton (1968) documented an earlier record (Provancher 1872) given as *Lygus unicolor*. This immigrant palearctic species is now widespread over much of North America and is very common in the East; it is found most commonly on *Chenopodium album* L.

Melanotrichus flavosparsus could be confused with the western *M. coagulatus* because of the similar mottled-green dorsum and clustered, silvery, scalelike setae on the hemelytra. However, it is best separated from that species by the pale tibial spines, uniformly colored hemelytral membrane, and distinctive left paramere having the slender process curving away from the segment as illustrated by Kelton (1980).

Melanotrichus leviculus Knight

This species was first described from Sea Cliff, New York, on *Suaeda maritima* (L.) Dum. [Chenopodiaceae] (Knight 1927), and later reported from Texas (McGarr 1933) and Alberta, Manitoba, and Saskatchewan, on *Suaeda depressa* (Pursh) Wats. and *Salicornia rubra* A. Nels [Chenopodiaceae] (Kelton 1980). This species is recognized by its small size (3.00 mm or less) and uniformly pale dorsal pubescence.

New state records are FLORIDA: Monroe Co., Plantation Key, 8 April 1981, T. J. Henry and A. G. Wheeler, Jr., taken on *Suaeda linearis* (Ell.) Moq. (PDA, USNM); Monroe Co., Upper Key Largo, 9–18 April 1981, T. J. Henry and A. G. Wheeler, Jr.,

taken on *S. linearis* (PDA, USNM). An additional record for Texas is Refugio Co., S. of Bayside, 20 April 1983, T. J. Henry and A. G. Wheeler, Jr., taken on *Suaeda linearis* (PDA, USNM).

Melanotrichus virescens (Douglas and Scott)

As discussed under *M. concolor*, Knight's (1922) Woods Hole, Massachusetts, specimens represent the first North American record for the palearctic *M. virescens*. It is likely that Moore's (1950) report of *M. concolor* from Quebec also refers to *M. virescens*. This immigrant mirid is also known from British Columbia (Scudder 1960), California (Waloff 1966), and Oregon (Anon. 1968), indicating that probably there have been several introductions into North America. Waloff (1966) studied this Scotch broom, *Cytisus scoparius* (L.) Wimm., specialist in the Pacific Northwest.

This species is distinguished from all other eastern species of *Melanotrichus* by the short rostrum, black tibial spines and femoral setae, and the dark-green dorsum, thickly set with long, dark, bristlelike setae.

Melanotrichus whiteheadi Henry, NEW SPECIES

Figs. 1–13

Diagnosis.—Separated from all other eastern species of *Melanotrichus* by the short 2nd antennal segment that is shorter than the basal width of the pronotum, the uniformly green dorsum, and short rostrum that extends only to the posterior margin of the mesosternum.

Description.—Orthotylinae: Orthotylini. *Male* (n = 10): Length 3.24–3.76 mm, width 1.28–1.44 mm. *Head*: Width 0.76–0.80 mm, vertex 0.38–0.40 mm. *Rostrum*: Length 0.88–0.96 mm, extending to posterior margin of mesosternum. *Antenna*: Segment I, length 0.26–0.30 mm; II, 0.84–0.94 mm; III, 0.72–0.84 mm; IV, 0.26–0.32 mm. *Pronotum*: Length 0.54–0.60 mm, basal width 1.14–1.20 mm.

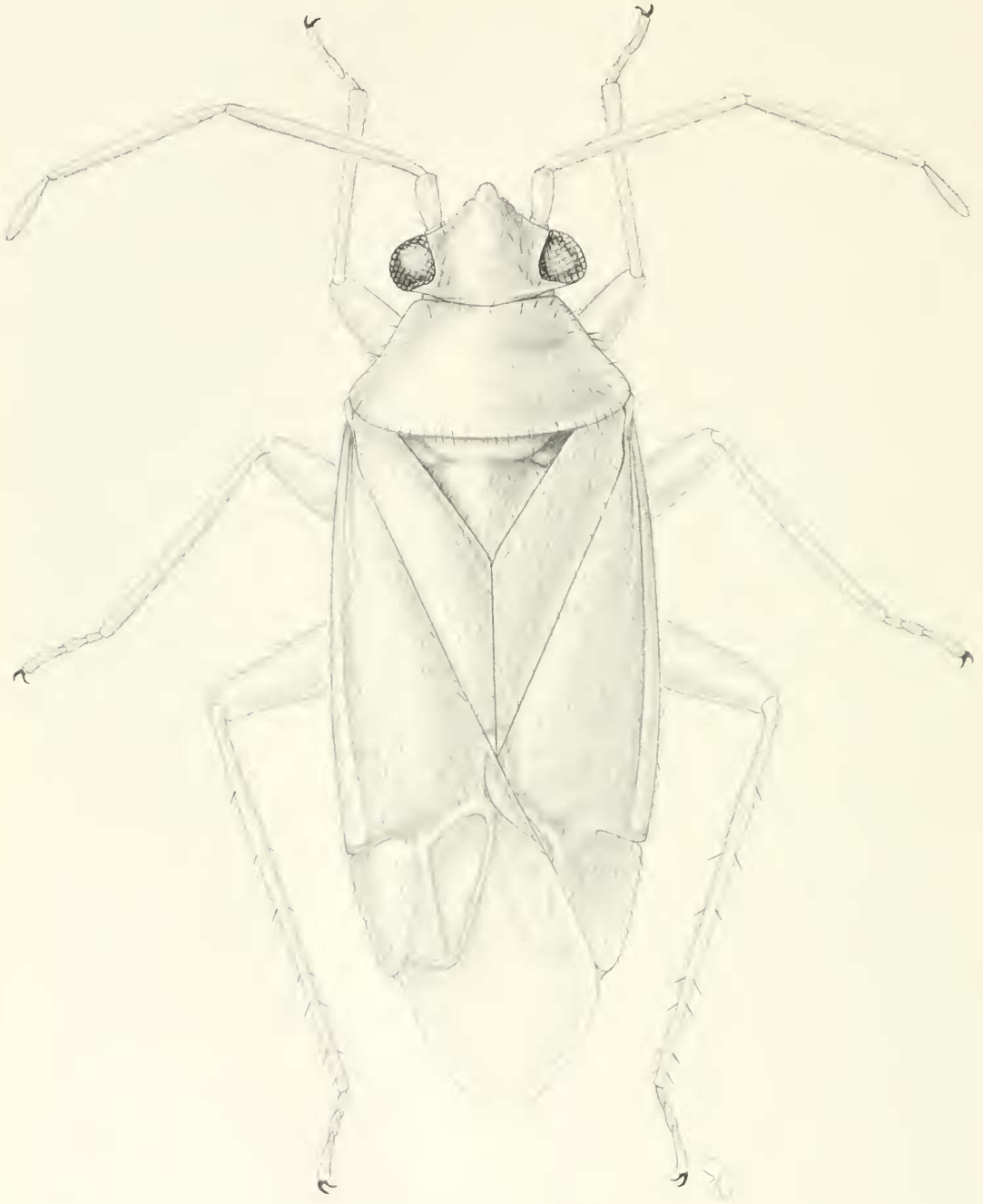
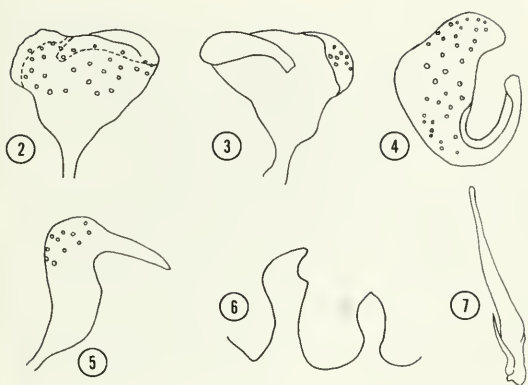


Fig. 1. *Melanotrichus whiteheadi*: male habitus.



Figs. 2–7. Male genitalia of *M. whiteheadi*: 2. Left paramere (posterior aspect). 3. Left paramere (anterior aspect). 4. Left paramere (dorsal aspect). 5. Right paramere. 6. Spicules of vesica. 7. Ventral processes of aperture.

Female ($n = 10$): Length 3.44–3.92 mm, width 1.42–1.62 mm. **Head**: Width 0.72–0.84 mm, vertex 0.42–0.50 mm. **Rostrum**: Length 1.02–1.04 mm, extending to posterior margin of mesosternum. **Antenna**: Segment I, length 0.26–0.30 mm; II, 0.84–0.96 mm; III, 0.70–0.74 mm; IV, 0.30–0.32 mm. **Pronotum**: Length 0.52–0.62 mm, basal width 1.16–1.32 mm.

Generally green to greenish yellow. Head subtriangular; tylus produced and acute in dorsal aspect (Fig. 9), wide and flattened anteriorly in lateral aspect (Fig. 8); base wider than anterior pronotal margin and thickly carinate; eyes prominent, more so in males; vertex equal to combined widths of eyes in males, about 1.5 times combined widths of eyes in females. Antennal segment I green to greenish yellow, about 2 times as thick as segment II; segment II green at base, becoming dusky distally, slightly more thickened in males; segments III and IV dusky. Pronotum trapeziform, calli weakly swollen, yellow; posterior $\frac{1}{2}$ green. Mesoscutum yellow; scutellum yellow, especially at base, to green. Hemelytron translucent green, with claval and emboliar margins often darker bluish green; subparallel in males, more broadly oval in females; cuneus very pale, translucent green to nearly transparent;

membrane translucent brown with veins pale green. Ventral surface of body yellowish green. Legs green to greenish yellow, tibial spines pale, claws (Fig. 11) brown. Vestiture: Head and pronotum thickly set with erect and suberect, pale, simple setae; hemelytron with erect and suberect, dark, rather stout, simple setae; dorsum intermixed with silvery, somewhat slender, scalelike setae (Figs. 12–13); apical $\frac{1}{2}$ of clavus and middle of corium with sparsely scattered, dark-brown, scalelike setae.

Male genitalia: Left paramere (Figs. 2–4), broad, tapering basally in caudal or posterior aspect (Fig. 2), somewhat C-shaped in dorsal aspect (Fig. 4) with a slender, inward curving arm; right paramere (Fig. 5) relatively simple, somewhat L-shaped, tapering apically; vesica with 2 spicules (Fig. 6) and a distinct secondary gonopore; phallosome membranous, forming a simple, transparent sheath around vesica; aperture round, basal margin with 2 stout processes (Fig. 7) projecting dorsally, visible only after the parameres are removed.

Type material.—Holotype: δ , South Carolina, Bamberg Co., Bamberg, Rt. 78, 24 April 1988, T. J. Henry and A. G. Wheeler, Jr., taken on *Descurainia pinnata pinnata* (USNM). Paratypes: FLORIDA.—7 \varnothing , Alachua Co., Gainesville, Rt. 24, 23 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (FSCA, USNM); 9 δ , 8 \varnothing , Duval Co., Jacksonville, Rt. 1, 5 April 1981, T. J. Henry, A. G. Wheeler, Jr., and D. R. Whitehead, taken on *D. p. pinnata* (USNM); 1 δ , 6 \varnothing , Gilchrist Co., Rt. 129, 5 mi. N. of Trenton, 30 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (USNM); 2 δ , 7 \varnothing , Jefferson Co., Rt. 98, 1 mi. W. of Taylor Co. line, 30 April 1984, T. J. Henry and A. G. Wheeler, taken on *D. p. pinnata* (USNM); 12 \varnothing , Lafayette Co., Rt. 27, 2 mi. W. of Mayo, 30 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (USNM); 1 \varnothing , Lake Co., Rt. 27, nr. Clermont, 24 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D.*



Figs. 8–13. Scanning electron micrographs of *M. whiteheadi*: 8. Lateral aspect of head (122 \times). 9. Dorsal aspect of head (116 \times). 10. Ostiole (253 \times). 11. Claw (661 \times). 12. Scalelike setae on scutellum (1090 \times). 13. Scalelike setae on hemelytron (635 \times).

p. pinnata (USNM); 6 δ , 21 φ , Levy Co., Rt. 27, 4.5 mi. S. of Jct. 24, 29 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (FSCA, USNM); 2 φ , Nassau Co., at Jct. I-95 & Rt. 17, 22 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken

on *D. p. pinnata* (USNM); 1 φ , Putnam Co., Welaka Res. Sta., blacklight, 8-IV 1983, D. A. Rider (DAR); 10 φ , Suwannee Co., Rt. 129 at Jct. 27, E. of Branford, 30 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (USNM). GEORGIA.—3

♀, Brantley Co., Rt. 84, nr. Nahunta, 4 May 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (USNM); 10 ♂, 21 ♀, Glynn Co., Jekyll Island, Rt. 17, 22 April 1984, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (AMNH, FSCA, USNM); 1 ♂, 1 ♀, McIntosh Co., Rt. 251, at Darien, 4 May 1984, T. J. Henry and A. G. Wheeler, taken on *D. p. pinnata* (USNM). SOUTH CAROLINA.—33 ♂, 36 ♀, same data as for holotype (AMNH, FSCA, USNM); 3 ♂, Berkeley Co., Jamestown, 25 April 1988, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (USNM); 21 ♂, 25 ♀, Dorchester Co., Rt. 78 at Jct. 178, S. of Harleyville, 25 April 1988, T. J. Henry and A. G. Wheeler, taken on *D. p. pinnata* (USNM); 6 ♂, 11 ♀, Georgetown Co., Georgetown, 25 April 1988, T. J. Henry and A. G. Wheeler, Jr., taken on *D. p. pinnata* (USNM).

Etymology.—I dedicate the name of this mirid in remembrance of my very good friend Donald R. Whitehead, who helped collect the first specimens of it during a memorable fieldtrip to Florida in 1981. His thought-provoking conversations and companionship will be missed.

Host.—Adults and nymphs were taken in abundance on the southern subspecies of tansy mustard, *Descurainia pinnata pinnata* (Walt.) Britt. (Brassicaceae). This is only the second North American mirid known to specialize on crucifers.

Melanotrachus albocostatus Knight, known from Alberta and Saskatchewan, south to Arizona and Colorado (Henry and Wheeler 1988), has been recorded from *Descurainia sophia* (L.) Webb (Kelton 1980). I also have studied specimens of *M. albocostatus* from *Descurainia* sp. and *Cardaria* sp. in Colorado (UCM) and from London rocket, *Sisymbrium irio* L., in Arizona (USNM).

Distribution.—Known only from Florida, Georgia, and South Carolina, but probably will be found wherever its host *D. pinnata pinnata* occurs—Virginia, south to

Florida and Texas (Gleason and Cronquist 1963).

KEY TO THE EASTERN NORTH AMERICAN SPECIES OF *MELANOTRICHUS*

- 1. Length of second antennal segment less than basal width of pronotum 2
- Length of second antennal segment distinctly greater than basal width of pronotum 4
- 2. Rostrum long, extending well beyond metacoxae *brindleyi* Knight
- Rostrum shorter, never extending beyond metacoxae 3
- 3. Dorsum dusky brown, with paler yellow areas; rostrum extending to metacoxae *catulus* (Van Duzee)
- Dorsum uniformly green, never brown; rostrum extending to posterior margin of mesosternum, rarely to mesocoxae *whiteheadi*, new species
- 4. Silvery scalelike setae on dorsum occurring in thick patches; hemelytral coloration mottled green (i.e. green with pale areas or pale green with darker green blotches) 5
- Silvery scalelike setae on dorsum evenly scattered, never occurring in thick patches; dorsum uniformly green 6
- 5. Tibial spines brown to fuscous; membrane translucent with a small, dusky-brown cloud just beyond veins; slender arm of left paramere curved inward *coagulatus* (Uhler)
- Tibial spines pale; membrane uniformly translucent; slender arm of left paramere curved away from segment *flavosparsus* (Sahlberg)
- 6. Length 3.00 mm or less; simple setae on dorsum always pale *leviculus* Knight
- Length 4.00 mm or greater; dorsum with both pale and fuscous or black simple setae 7
- 7. Dorsum dark green, thickly set with long, fuscous to black, bristlelike setae; setae on femora dark; tibial spines black *virescens* (Douglas & Scott)
- Dorsum pale green, pubescence predominately pale, intermixed with some darker setae; setae on femora and tibial spines pale *concolor* (Kirschbaum)

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